

SCIENCE EDITION

BONE BREAKDOWN



Baby boomer's bones are getting older. Osteoporosis, a bone disease prevalent in elderly women, is now attracting big research dollars. Ironically, the most important preventative measure for this widespread disease is simply to drink a glass of milk.

TARA PATEL

Dr. Alan Tenenhouse, director of the Division of Bone Metabolism of the Montreal General Hospital gave a public lecture entitled 'Osteoporosis—the Aging Skeleton' October 18.

The lecture was the first of the 'From Bed to Bedside' series sponsored by the McGill Faculty of Medicine. This lecture series emphasizes the direct impact of medical research upon clinical treatment.

As the voting population ages, the politics governing research grant allocations changes. Accordingly, recent workshops in Ottawa have dealt with osteoporosis, a disease of the elderly.

The scientists gathering in Ottawa had to start from the beginning. Until now there was not even a clear consensus on the definition of the disease.

Osteoporosis is a disease of the bone. Its victims have bone loss so great that it impedes function. Their skeletons are extremely fragile and bone fractures can occur during normal daily activity.

This is what makes politicians so nervous, says Tenenhouse. Since the beginning of the 1980s, there have been over 10 000 fractured hips in Canada. With a cost of 6-10 billion dollars per year and a mortality rate of ten to twenty percent, the government is worried.

Bones are very active organs continually undergoing breakdown and resynthesis. Osteoporosis is a drastic outcome of a normal metabolic function, a process that has gone too far.

Throughout childhood and adolescence there is a net synthesis of bone, hence growth. Bone mass continues to increase even though height does not until the age of 35 to 40, when the rate of synthesis is equal to the rate of breakdown and bone mass remains constant.

After this peak bones begin to breakdown, or are resorbed. If bone loss is too great, the condition becomes a pathological one — labelled osteoporosis.

There are two types of bone. The cortical bones are long and thick and do not deteriorate significantly. The trabecular bones, prominent in the vertebrae, support the skeleton. The earliest fractures to occur in osteoporosis are vertebral.

the risk of uterine cancer—but risk is minimized if progesterone is given at the same time.

Weight bearing exercise prevents bone breakdown. According to Tenenhouse, swimming is not good exercise for maintaining skeletal mass.

Drugs are available which inhibit bone breakdown. Others are being tested which may actually increase bone mass.

Tenenhouse is also very enthusiastic about the most important diagnostic tool for osteoporosis—dual photon absorptionmetry. He said X-ray exposure is so minimal the procedure should be used routinely on all post-menopausal women.

Tenenhouse said osteoporosis only affects certain types of people.

Prevention of osteoporosis is not complicated. The good doctor used the magic words, "diet and exercise."

Caffeine and protein should not be consumed in excess. Intake of calcium, an important composite of bone, should be about 1000 milligrams per day. Vitamin D is also necessary, and a balanced diet provides an adequate supply.

Despite the severity of osteoporosis, the prognosis does look hopeful. The distance between bench and bedside is not far. With a successful combination of medical research and common sense, osteoporosis may be one less thing for our generation to worry about.

Bone Aid

by Tara Patel

In response to the osteoporosis scare, pharmaceutical companies are now heavily promoting calcium and making a lot of money. Some even claim TUMS contains sufficient amounts to do the trick. According to Dr. Alan Tenenhouse, calcium is the chief means of preventing the disease.

Calcium helps build our skeletons maximally when we are young. We lose about 250 milligrams of calcium each day in our urine. He recommends we ingest 1000 milligrams per day. During growth, pregnancy or lactation, at least 1500 milligrams is necessary. These excesses compensate for our bodies' less than perfect absorption efficiency.

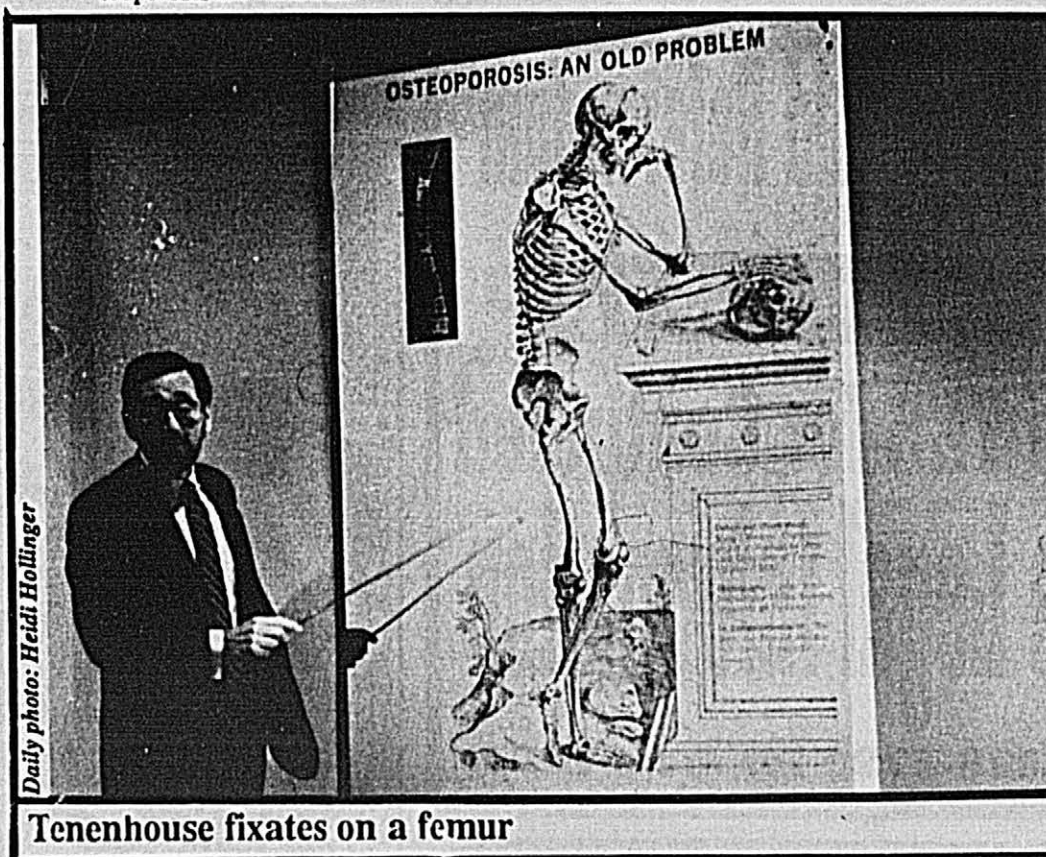
Where do we find calcium? There is plenty at the drugstore—for over ten dollars per bottle. The best and cheapest source is skim milk.

The following all contain approximately 250 milligrams of calcium:

- 8 oz milk
- 1 1/2 oz cheddar cheese
- 1 1/2 cups cottage cheese
- 6 oz yogourt
- 3/4 cup salmon
- 5 medium sardines

According to Tenenhouse there is no evidence that calcium causes bone growth or prevents loss in people with osteoporosis.

So cheers to good health—but make this toast with a glass of milk.



Tenenhouse fixates on a femur

According to Tenenhouse, prevention is the most important way to manage this disease.

The higher the bone mass in middle age, the less likely enough bone will be lost in later life to cause symptoms.

Women suffer a much greater net bone loss because menopause triggers mass breakdown which lasts approximately twenty years. Estrogen treatment, used to alleviate the symptoms of menopause, can also control osteoporosis. It must, however, be given for the entire twenty years. As soon as it stops, bone loss increases dramatically.

Estrogen treatment does have one serious drawback. It increases

Post-menopausal, white, physically unfit or very thin women are the most likely candidates.

A prolonged cessation of the menstrual cycle or amenorrhea causes increased bone breakdown. Marathon runners and anorexics are frequently amenorrheic and thus vulnerable to osteoporosis.

It is the fat cells, said Tenenhouse, which manufacture the small amounts of estrogen still produced in post-menstrual women. Some fat is necessary to prevent too much bone loss.

Lifestyle is also very important. Tenenhouse pointed to alcohol abuse and cigarette smoking as possible contributors to the condition.

It's never too late to join the McGill Daily. We need writers, photographers, lay-out artists, SCIENCE writers (especially, says Tarek.)
Come down to Union B-03. Today!



2 Locations in the Heart of Downtown
 Light Meals, Salads, Soup, Capuccino & Espresso
 1112 Sherbrooke W/er Peel 386 Ste. Catherine W/
 Next to McGill 849-5492 or Bleury 871-8280
 Baked daily: Croissants, Danishes, French Pastries, Kishkes.
 Bagels, Quiche, Fresh Salads, Crepe Maison and Sandwiches.
 7 AM - 7 PM
DAILY SPECIALS \$3.25
 Quiet Relaxing Atmosphere



CAFE AU LAIT



elle wash cut blow dry \$18
 lui wash cut blow dry \$12.50
 Continental elle & lui Hair Styling
 Place Vile Marie 866-2881 Alexia Nihon Plaza 931-2571 Les Coiffures 2020 844-2400 Galerie Dupuis 842-9096 Place Bonaventure 878-4489

PEEL PLAZA DELI
 Delicious take-out sandwiches always ready or prepared for you while you wait.
 * Pastries
 * Groceries
 * Meats & Cheeses
 * Beer & Wine
 Open 8 am — 9 pm
 Open Sundays
PEEL PLAZA BLDG.
 3460 PEEL ST.
 843-3053

SALON SALLY
 ALL YEAR
 Specials for McGill Students
 Shampoo, cut and style: Men \$9
 Shampoo, cut and style Women: \$14
 Perm or modelling: Women or Men from \$20
 Facial: \$15 • Waxing: \$8 / \$15
 Electrolysis 20% discount
845-3109
 With or without appointment
 2085 Union • Mezzanine • Metro McGill

Dr. Donald, Gordon, Collins
 B.Sc., D.D.L.
 Dental Surgeon
 Chirurgien Dentiste
 by appointment
 sur rendez-vous
288-8531
 Place du Parc
 300 Leo Pariseau
 Suite 920
 (Corner Parc & Pine)
 Monday 12:00 to 7:00 pm
 Tuesday to Thursday 8:00 am to 7:00 pm
 Open Saturdays

OPTOMETRIST
 • Eyes Examined
 • Eye Glasses
 • Contact Lenses (all types)
 • Medicare card accepted
 Dr. David Kwavnick, O.D.
 1535 Sherbrooke St. W.
 (corner Guy)
 933-8700 or 933-8102

McGill Legal Aid Referendum
November 9, 10 & 11
Vote YES for Continued Free Legal Information
 (Call 398-6792 for more INFO)

HYPNOTHERAPY
 BY MEDICAL REFERRAL ONLY
 Successful results in the treatment of psychosomatic conditions...
STUDENTS
 Achieve **HIGHER GRADES** without anxiety stress or panic through hypnotherapy!
 Our offices are close to all major universities, CEGEPS and learning institutions.

• What about your studies? • Are you at present confronted with examination panic? • Writing your thesis and feel that the actual presentation for same will not live up to the stringent standards or criteria therein? • Shyness? • The ability to concentrate? • A lack of confidence? • The ability for better impression, memory retention and recall? • Study procrastination habits? • Are you in a do or die must pass this exam situation, along with anxiety, fatigue, tension and stress?

Allow the Pecarvé offices established since 1948 help you with successful scholastic achievements from this point on.
 • No short cuts • No group sessions • No advance payments • No gimmickry • No apparatus • Just Hypnosis • It works!
 To ensure more positive results and total confidentiality, we feel All Patients Treated with Strictest Confidence

R. PECARVÉ Inc.
 Hypnotherapists: Hypnoanesthetist for Major or Minor Surgery
TWO BILINGUAL OFFICES TO SERVE YOU

WEST ISLAND Dollard des Ormeaux:
 West Island Medical Centre
 3400 rue du Marché, Suite 102
 For appointment call:
684-6408
 Ms. H. Steinwald Assoc.

DOWNTOWN MONTREAL:
 Seaforth Medical Building
 3550 Côte des Neiges, Suite 690
 each client should be afforded individual personal attention, with sessions on a one-to-one basis only. Furthermore, to make you feel secure during your session, which makes for better overall treatment, male or female bilingual therapists are available to cater to everyone's need.
 • Smoking • Obesity • Stress • Anxiety • Hypertension • Drinking • Stuttering • Insomnia • Migraines • Bedwetting • Memory (re: Studies) • Impotence • Frigidity • Childbirth • Pain Relief • Bladder Frequency • Confidence • Blushing • Panic • Phobias i.e. dental chair, flying • Public Speaking • Dizzy Spells • Sweating • Nervous skin conditions (neurodermatitis) • Nervous stomach (digestive upsets) • Hot Flushes • Asthma • Drug Abuse, etc.
 International Authority on Ethical Hypnosis



R. Pecarvé, Director



STARTING FROM SCRATCH:
 The new situation comedy television series starring **Bill Dally** (of *I Dream of Jeannie*) and **Connie Stevens**, is presently taping in Downtown Montreal. The **first 50 callers** on Wednesday November 2 between **9 a.m. and 5 p.m.** at 598-5526 will receive two free tickets to this Friday nights 6 p.m. taping. **Don't miss out!**

Presented by **WORLDVISION ENTERPRISES INC.**
MOLSTAR
 Production Sponsored by **Montreal Daily News**
CJFM

Gas exchange at McGill

by Anne-Marie Perrotta

One hundred oceanographers and meteorologists from across Canada, the United States, Europe and Japan gathered at McGill University from October 17-19 to discuss the role of the oceans in the global carbon cycle and in the development of the 'Greenhouse Effect'.

The result of the workshop was a scientific plan for Canada's partici-

pation in the Joint Global Ocean Flux Study, an international effort to predict the exchange of carbon dioxide and other gases between atmosphere and ocean.

Canada, with the world's longest coastline, will play a key role in the study.

Scientists at the workshop predict the accumulation of atmospheric carbon dioxide will increase global temperatures two to five

degrees over the next 50 years. Carbon dioxide accumulation results from fossil fuel burning. The increase may be greater for high latitude areas such as Canada. This temperature increase is known as the 'Greenhouse Effect.'

The workshop brought together scientists from both government and universities to focus on the critical problem.

"In view of the potential magni-

tude of the social and economic implications, we felt it was necessary to make the best possible use of Canada's scientific resources," said Dr. Marlon Lewis from Dalhousie University, convenor of the workshop.

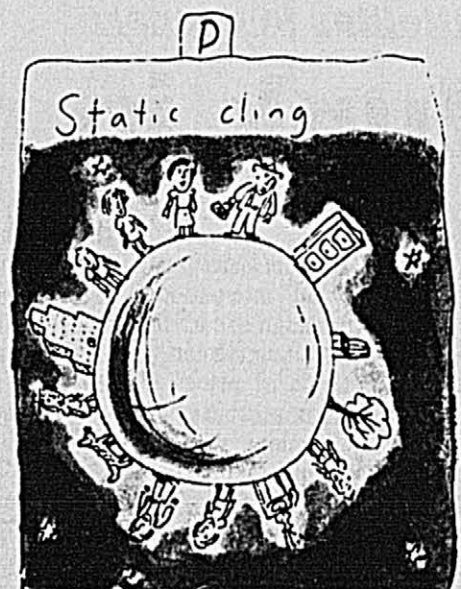
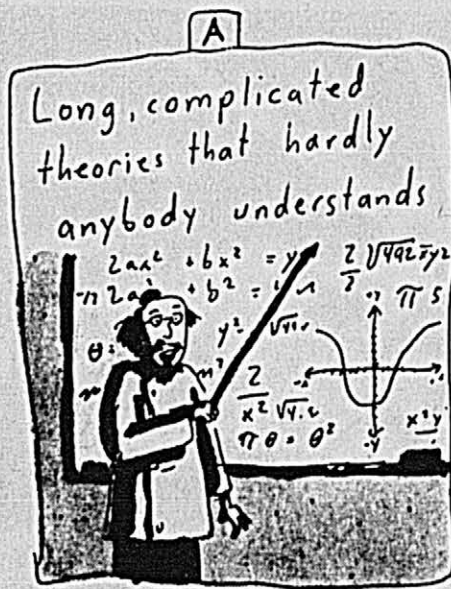
The scientists decided to begin research immediately on a ten year program to understand the complex physics, chemistry, biology, and geology involved in determining the ocean's role in the global carbon

cycle.

Canada's oceanographers and meteorologists will work closely together to aid in the strategic planning necessary for a warmer earth.

The workshop was supported by the Natural Science and Engineering Research Council, the National Research Council, and the Department of Fisheries and Oceans. The Faculty of Science and the Climate Research group at McGill hosted the conference.

WHAT HOLDS THINGS TOGETHER?



Oracle: yawning and deja vu

by Caitlin Huckell

Why are yawns contagious?

You're sitting minding your own business and you happen to look at someone who is yawning—whether you like it or not, you find yourself yawning too. Why? Well, apparently the yawn conveys a message to your 'unconscious monitoring system'. When another person is observed yawning, the counter yawn is an instinctive reaction induced by the unconscious mind. It interprets the yawn as a signal that the environment lacks oxygen. The yawn draws more air into the lungs faster than a normal breath, thereby increasing the oxygen supply to the body. So there it is, the definitive answer. Everything else you've ever heard is wrong.

What is deja-vu?

Slumping in class, listening to the prof drone on and on and on and on, one is suddenly struck with a feeling that this has all occurred before. Psychic connections? Telepathic ability? You're a McGill undergrad? Maybe, but deja-vu can be explained scientifically. (Everything can be explained scientifically). It represents a screw-up in the brain's normal pattern of operation. The observation is 'filed' into memory before being completely analyzed. Therefore,

the brain perceives the observation as a memory first, due to a reversal of perception and storage activities. The image appears to be familiar, yet is being encountered for the first time. An alternate hypothesis involves an impairment of the electrical transmission system (neurons, synapses etc.) so that the information being perceived is transmitted unusually slowly throughout the

brain. One therefore perceives the info bit by bit and some is entered into memory while some is still being perceived: deja-vu again.

We challenge you to come up with any phenomenon that you think cannot be explained scientifically and send it to us. We'll come up with some solution. Guaranteed.

All contents copyright ©1988 by the Daily Publications Society. All rights reserved. Opinions expressed in the pages of the newspaper do not necessarily reflect the views of McGill University. Products or companies advertising in this newspaper are not necessarily endorsed by the Daily staff. Printed by David Martin Development Inc., Montréal, Québec.

editorial board

co-ordinating editor Jennifer August
co-ordinating news editor Eric Smith
layout and design co-ordinators Yvonne Bayer, Tamsin Douglas
news editors Miku Sengupta, Karen Valihora, Joyce Lombardi
daily français Pierre Carabin, Isabelle Clément

science editors Kim Binsted, Tarek Razek
supplement editors carl p wilson, Egg
photo editor Heidi Hollinger...
features editors Susana Bejar, Zeb Brown
CUP editor

contributors

Chris Marshall
Tara Patel
Marc Patel
Anne Marie Perrotta
Tarek's MOM
Laura McLeish
Caitlin Huckell
Mother Xiao

Raina Suenick

Editorial offices: 3480 McTavish, room B-03, Montréal, Québec, H3A 1X9,
telephone (514) 398-6784/85
Business Manager: Kim Penney, room B-17, telephone (514) 398-6791
Advertising: Caroline Elie, Boris Shedov, room B-17, telephone (514) 398-6790
Advertising Layout and Design: Mike Sportza

The Daily is a founding member of Canadian University Press (CUP), Presse étudiante du Québec (PEQ), Publi-peq and CampusPlus.



Physics: a quantum leap easier

by Chris Marshall

Qed: The Strange Theory of Light and Matter

A. K. Feynman
Princeton Science Library,
1985.

about \$12.00 paperback.

Richard Feynman was one of science's most enigmatic thinkers. Nobel prize winner, professor at CalTech, bongo player, and locksmith, Feynman could explain things masterfully.

QED is a book about quantum-

electro dynamics (hence the title) and presents the reader with no equations, no complicated 'physics talk', and no mathematics apart from addition and subtraction. The book is both straightforward and easy-to-follow. Feynman states in his introduction that he is writing at the graduate physics level, so the uninitiated cannot hope to understand the intricacies of his book. But the accessibility of his writing undermines the claim. Feynman later admits that neither his graduate students nor he can understand it either. His aim is not to explain why the universe behaves as it does, but

merely to describe it this behaviour.

Feynman begins by defining what quantum-electro-dynamics is (concluding that it deals with small electrical things moving) and then leaps into the world of the impossible. Beginning with photons, he explains the physics of windows (how a solid object lets light through) the physics of water (how a glass of water bends light) and the physics of a mirror (how a solid reflects light). He leaves no question unanswered, no assumptions ignored. Everything is explained without the use of complex mathematics.

Once these foundations are laid, he presses on to the more complex. Everyone has looked out a window into the twilight. What do you see? The glass lets light through, so you can see what is outside, but it also reflects the light from the room. By looking outside you can see inside. Feynman asks the obvious question—which I had never thought to

ask—how does the same piece of glass act as both window and mirror? Having finished with photons, he moves on to other aspects of the quantum universe.

Feynman has the rare talent to make the utterly mundane, enthralling. He is not presenting earth-shattering physics, but is explaining for those uninitiated with quantum and particle physics the way the world works. Feynman has written the best basic introduction to this branch of physics. The book is actually a transcript of four lectures delivered in 1985, and represents his humour and lucidity. The illustrations follow Feynman's reasoning step-by-step making the implications of quantum theory truly accessible to the uninitiated for the first time.

Sattelites in danger:

Junk in orbit

By Hugh Westrop

A British Columbia astronomer has called for an international anti-littering campaign to curb the amount of junk orbiting the earth.

Many thousands of pieces of space garbage are now orbiting the earth, says Dr. Sydney van den Bergh of the Dominion Astrophysical Observatory in Victoria. This growing cloud of junk is making it increasingly difficult for satellites to safely circle the globe and for astronomers to get a clear view of the skies.

"The number of space objects is doubling every decade, and by the middle of the next century there will be so much junk up there, it will be quite impossible to operate safely," said van den Bergh.

Though most of the trash is very small—no bigger than a dime—it still poses a real danger to orbiting spacecraft because it moves so fast—about 10 kilometres a second, or about 36 000 kilometres an hour. At these velocities, even tiny pieces of debris have an explosive-like energy. One of the windows of the space shuttle Challenger was cracked when it was hit by a mere fleck of paint.

It is estimated that a fast-moving fragment the size of a pea could easily shatter a \$100 million satellite. These tiny particles are dangerous because they cannot be detected by earth-based sensors.

Scientists are not sure exactly how many pieces of small debris are in orbit. They do know there are about 60 000 orbiting objects the size of a gumball or larger, which pose a threat to astronauts, spacecraft and still-operating satellites.

The U.S. National Aeronautics and Space Administration is also concerned about potential damage to the shuttle and the \$20 billion international space station, which will be built in the 1990s by the U.S., Canada, Japan and the European Space Agency.

Joseph Mahon, NASA's deputy associate administrator for space flight, estimates that, at the current density of debris, there is a one-in-

thirty chance of the shuttle being hit. If nothing is done to reduce the rate of increase of debris, those odds could increase to one-in-ten by the year 2000 and one-in-four by 2010.

The larger pieces of orbiting garbage include exhausted rocket boosters, dead satellites and even an astronaut's wrench, lost from the shuttle during a space walk. The small pieces of debris were created by the accidental breakup of more than 16 rockets and satellites. "Rockets were once designed in such a way that their fuel tanks were very vulnerable to explosion," van den Bergh said.

"Also, one satellite has been deliberately exploded in tests of the U.S. 'Star Wars' defence program," he added.

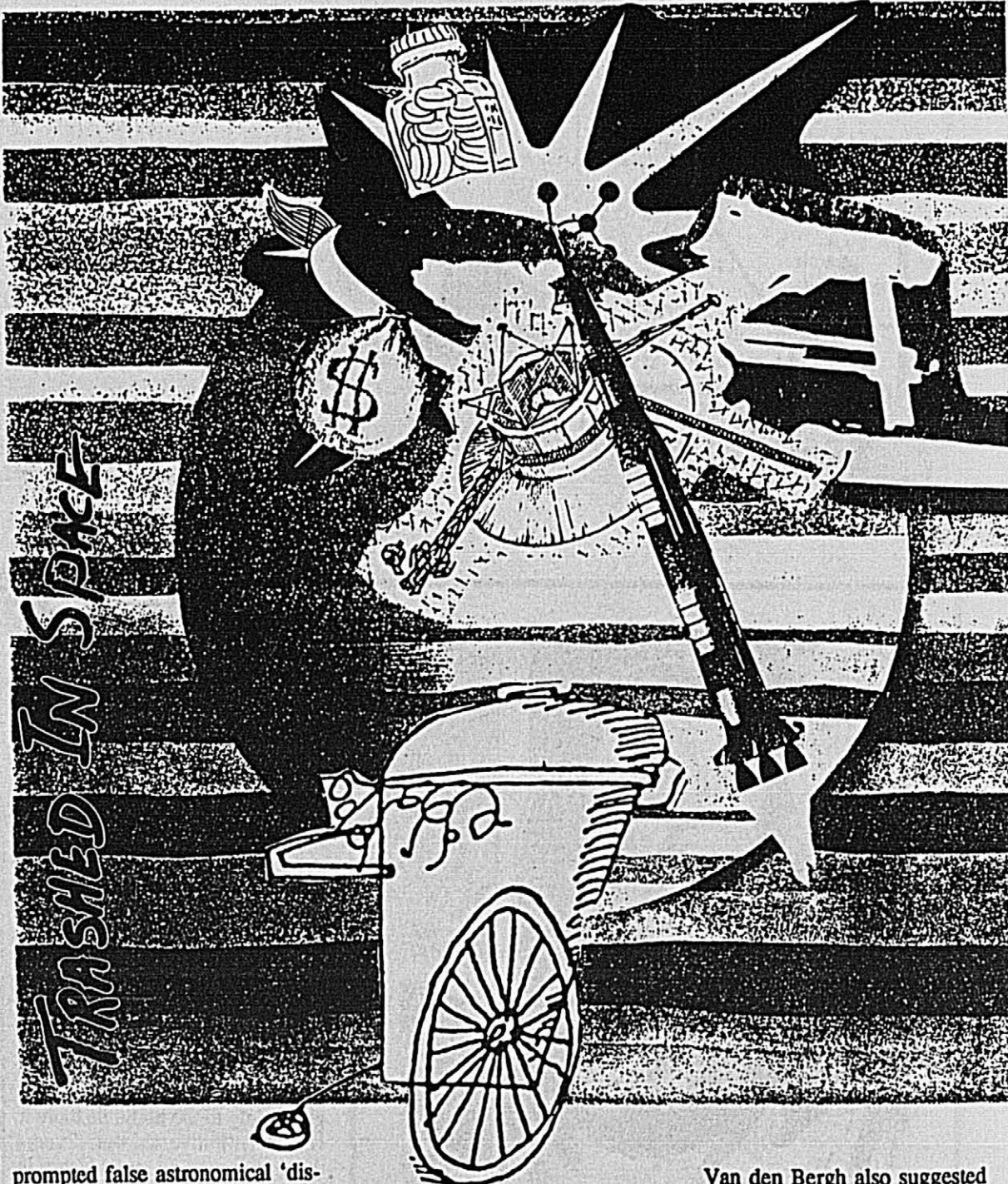
Van den Bergh is particularly worried about the \$1 billion Hubble Space Telescope, due to be launched in 1990. "This telescope will give astronomers a ten-times better look at the universe than we have ever gotten with earth-based telescopes," he said.

According to one study, the Hubble Space Telescope will suffer at least one collision with a piece of space debris during its lifetime. "Depending on where the debris hits, it could lead to a catastrophic failure," said van den Bergh.

Though it is now too late to protect the Hubble Space Telescope, engineers are developing a special armour for the planned space station. It will protect it against particles up to one centimetre in size. Engineers are also modifying rocket designs so that a collision with space junk will not cause an engine explosion in space.

Not only is the space junkyard hazardous, it is blocking astronomers' view of the universe, said van den Bergh. He estimates that one-third of all the pictures now taken by wide-angle optical telescopes must be discarded. "The orbiting junk reflects sunlight, which leaves a trail across the picture like that of a shooting star," he said.

Already, orbital pollution has



prompted false astronomical 'discoveries'. Scientists thought they had discovered a group of powerful pulsing stars which turned out to be reflections off the solar panels of dead satellites.

According to van den Bergh, scientists should reexamine the United Nations Space Treaty of 1976. "The treaty deals only with operating space satellites. We didn't realize at the time it was drawn up that 95 per cent of the stuff up there is junk."

Van den Bergh said a new international agreement should prohibit the use of explosion-prone fuel storage systems in space, and

should ban space experiments that result in the fragmentation of existing satellites.

He added that 'geosynchronous' satellites (high-orbit satellites that are stationary with respect to the earth) should be equipped with enough fuel to boost them into higher orbit after they are no longer useful. The available orbit space for geosynchronous satellites is small, so old ones should be removed to make way for new, operational satellites. Fuel and other limitations make it difficult to blast them away from earth or back to fall to the ground.

Van den Bergh also suggested barring the use of space for activities with "little or no redeeming social value" such as proposals to orbit cremated human remains encased in small, shiny canisters.

Last spring, international pressure from the scientific community stopped the French government from launching 100 aluminum-coated spheres into space to celebrate the 100th anniversary of the Eiffel Tower. "The spheres would have looked like a ring of very bright stars. It would have been disastrous for astronomers," said van den Bergh.

(Canadian Science News)

TO TRAP AN ION

Imagine holding one atom in your hand so you could watch, weigh and measure it.

Unfortunately, this basic experiment cannot be done, at least, not without one of nuclear physics' more spectacular tools—the ion trap.

MARC NANTEL

An understanding of the physical world begins with examining the world's building blocks and the way they interact. Atoms are invisible to the human eye, even aided by a microscope, so scientists must perform complex experiments to determine even their simplest properties.

Atoms are made of a dense nucleus, with electrons orbiting around it. Nucleus and electrons are bound together, the positively charged nucleus attracting the negatively charged electrons. Neutral atoms have the same number of protons and electrons; removal or addition of electrons charges the atom positively or negatively. Charged atoms are called ions.

porization and/or ionization, producing a gas of atoms or ions. This gas must then be confined in a small, dense pack which can be observed and experimented with.

ISOLATING THE BEASTS

In the case of ions, the box in which they are confined is called an ion trap. Since ions are electrically charged, they can be held in an electromagnetic field.

This method of confinement not only allows direct experimentation on the ions by changing the electromagnetic field, but also allows direct observation since the electrodes generating the field do not form a closed box. This permits the creation of the

The electrodes produce fields that push the ions towards the centre of the trap.

Traps can be classified into two groups: Penning traps and Radio-Frequency Quadrupole (RFQ) traps.

Penning traps were the first to be used. They are simpler to use because they have two constant fields, one electric and one magnetic.

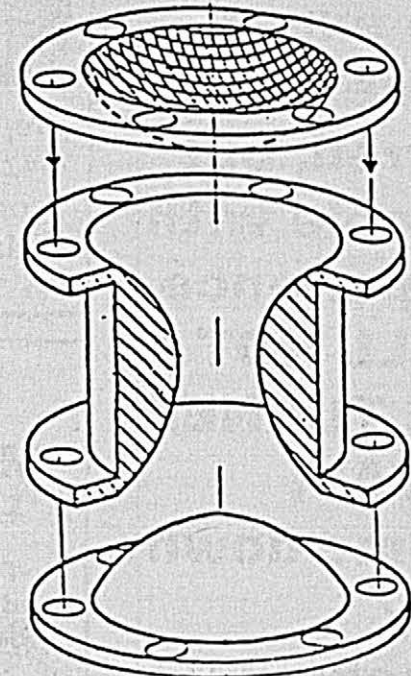
Perhaps the most impressive use of the Penning trap was in 1984 when Dehmelt and Ekstrom observed a single electron for several weeks. Because of the long observation time, they were able to measure intrinsic properties of the electron with record precision. They couldn't 'see' the electron, but they detected it and followed it via the current it induced on the electrodes when it moved.

Charged particles caught in ion traps do not just sit idle but orbit through the fields in complicated oscillations. In effect, the electron and the trap make up an atom of macroscopic dimension with the 'nucleus', the trap, surrounding the orbiting electron.

Because the apparatus is in a lab which rests, ultimately, on the Earth, the nucleus has been identified with the Earth itself. Thus, the artificial atom has been named 'geonium', or 'earth atom'.

The RFQ trap, although more complex, is widely used. Its main advantage is the absence of a magnetic field. Magnetic fields can be a drawback when studying the electronic levels in an atom as they tend to alter them. Time-varying fields are used to provide trapping.

In 1980, Neuhauser, Hohenstatt, Toschek and Dehmelt observed, visually, a single trapped barium ion. Their trap was only 250 micrometres, or 25 thousandths of a centimetre, in diameter. They shot laser light at it and photographed the scattered light with an exposure time of only ten minutes.



Cross section of ion trap

CAGED ANTIMATTER

If the thought of holding a single atom in your hand leaves you unfazed, let's talk of the trapping of anti-matter!

Since anti-matter and matter annihilate one another on contact, only electromagnetic cages can hold anti-matter.

A group of physicists working at CERN (European Centre for High-Energy Physics) in Geneva trapped up to ten million antiprotons in a Penning trap in 1986. They held them for more than 100 seconds. With better vacuum conditions, they could have held them longer.

Before this revolutionary experiment, anti-matter had only been seen as high velocity particle beams. The trap effectively stopped the antiparticles, creating a high-density, nearly immobile mass of anti-matter.

**ONLY
ELECTROMAGNETIC
CAGES CAN
HOLD ANTI-
MATTER**

Equally useful research is being done with RFQ traps. Collisions between atoms in a controlled environment can be studied. Several types of ions can be trapped simultaneously and ejected from the trap separately, in order to measure the masses of the ions.

Laser spectroscopy on high density ion clouds for better resolution is being perfected at McGill's Foster Radiation Lab using ion traps as ion-bunchers. Laser spectroscopy allows scientists to obtain measurements of the atom's nuclear properties.

Ion traps are useful for both pure and applied nuclear research. The fact that they employ very basic concepts to work only make them more elegant.

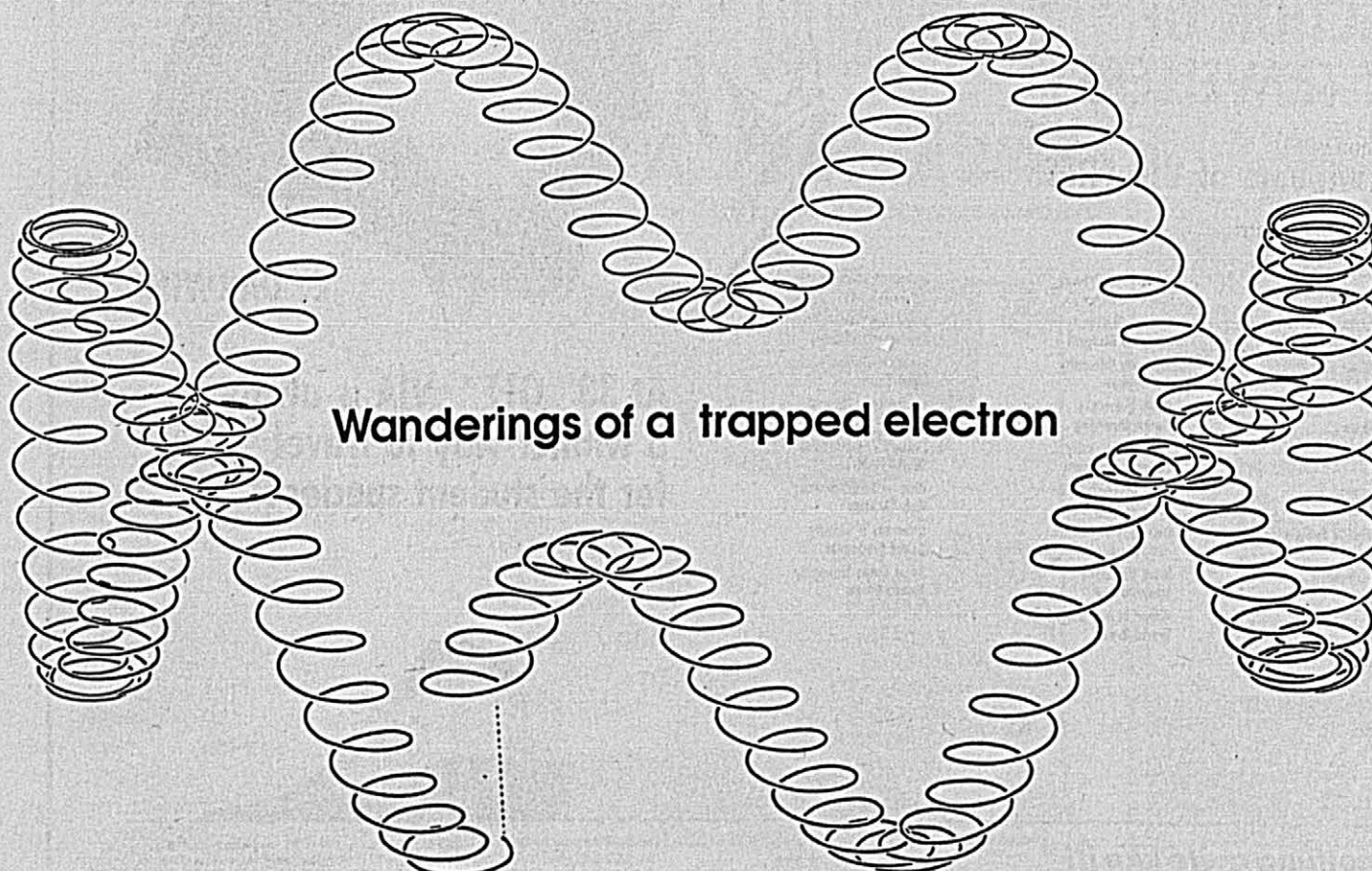
**SINCE IONS ARE ELECTRICALLY
CHARGED THEY CAN BE
TRAPPED IN AN
ELECTROMAGNETIC FIELD**

The qualities of these ions are difficult to discover. As most atoms occur in nature chemically tied to one another, studying groups of non-interacting atoms requires ingenious techniques.

Samples must first be purified through va-

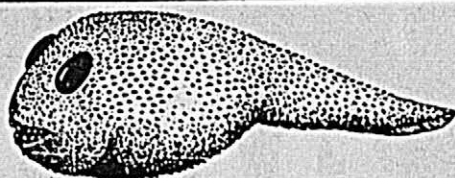
ions outside the trap for their subsequent insertion into and ejection from the trap through holes in the electrodes.

Ion traps range in size from less than a millimetre to about two centimetres. Most shapes follow the three electrode design.



Wanderings of a trapped electron

Desperately seeking Production People:
No experience preferred, but people with experience **WILL NOT BE TURNED AWAY.**
Come down any weeknight and talk to **Tamsin or Yvonne!**



Supermarché Gilles Ranger
3421 Avenue du Parc
(corner Sherbrooke)
Tel: 288-1536

Beer & Wine
Home Delivery

**EXAMS COMING UP?
PAPERS DUE?
MAKING BIG DECISIONS?**
LEARN TO TAKE IT ALL IN STRIDE!

Hillel & McGill Chaplaincy Services presents a...
FREE, STRESS MANAGEMENT WORKSHOP
Led by: **DR. TED BAKER, MCGILL COUNSELLING**



Date: Wed., Nov. 2nd
Time: 4 - 6 p.m.
Place: Hillel House (3460 Stanley)

For more info., call Cynthia (Hillel) 845-9171
or Roberta (Chaplaincy) 398-4104.

LES SALONS

SECRETS
COIFFURE

*Secrets has
a little magic
to share with you*

**Student
Special**

SALONS SECRETS
1015 SHERBROOKE W.
288-6000

HATS OFF TO ALL THE FREE PASS WINNERS!

**A NATURAL SELECTION OF
HAPPY STUDENT TRAVELLERS!**

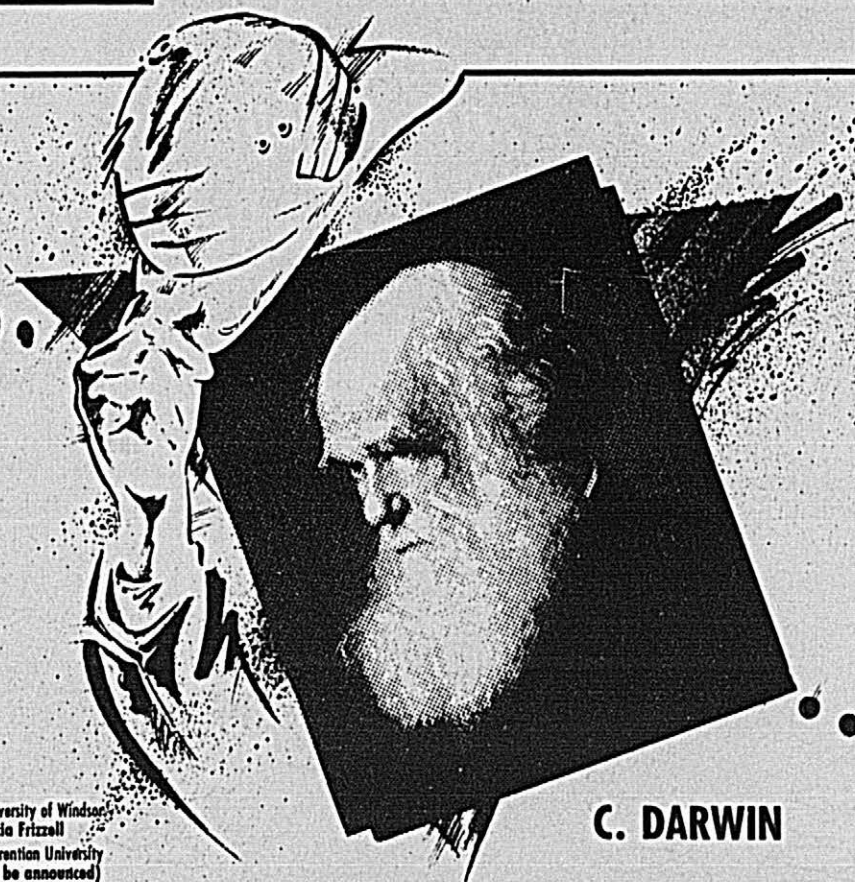
**Congratulations to the winners of VIA FREE
Unlimited Travel Passes:**

University of Ottawa
Danielle Fournel
University of Sherbrooke
Micheline Brousseau
University of Québec in Montréal
Luc Bélanger
University of Western Ontario
Margaret Ho
York University
(to be announced)
Ryerson College
Jennifer King
Queen's University
David Macbownes
University of Waterloo
Marie Sedivy
University of Guelph
Nancy Veehly
McMaster University
Niel Levine

University of B.C.
Laurie Brown
University of Alberta
Lisa Sokoluk
University of Montréal
Isabel St-Pierre
Laval University
Jean-Guy Gauthier
Moncton University
Mario Leonard
Mt-Alison University
Alexandra Tao
University of Québec in Rimouski
André Lévesque
St-Francis Xavier University
Tim McCann
Acadia University
Brenda Guptill
Dalhousie University
Robert Speirs

St-Mary's University
Mark Hamilton
Bishop's University
Suzanne Mulgall
Concordia University
Pat Archer
McGill University
Gavin Downing
Carleton University
Tamara Stephens
Trent University
Joanne Henrico
University of Toronto
Ian Johanssen
Brock University
Edmund Lee
Wilfrid Laurier University
David Broad

University of Windsor
Tricia Frizzell
Laurentian University
(to be announced)
Lakehead University
Noel Keog
University of Manitoba
Coleen Peters
University of Winnipeg
Matt Brown
Univ. of Saskatchewan
Rob Chartier
University of Calgary
David Francœur
Simon Fraser University
James Glave



C. DARWIN

**At 33% OFF*, VIA is always
a winner way to travel
for the student species!**



Take the train. There's nothing quite like it!™
™Trademark of VIA Rail Canada Inc.



* Student discount not applicable on Fridays and Sundays between 12:00-18:00 hours for intercity trips (Quebec-Windsor) corridor, and (Halifax-Fredericton), (Moncton-Cambrian) services except when travelling to a station outside above territories, AND not applicable on all train services from December 18, 1988 to January 4, 1989.

CLASSIFIEDS

Ads may be placed through the *Daily* business office, room B-17, Union Building, 9h00 - 15h00. Deadline is 14h00 two weekdays prior to date of publication.

McGill students: \$3.00 per day; \$7.00 for 3 consecutive days. McGill Faculty and Staff: \$4.00 per day; \$2.00 per day for more than 3 consecutive days. All others: \$4.50 per day. There is a 25 word limit. There will be a charge of 25¢ for each word over the limit. Boxed ads are available at \$4.00 per ad per day - no discounts on boxing. **EXACT CHANGE ONLY PLEASE.**

The *Daily* assumes no financial responsibility for errors, or damage due to errors. Ad will re-appear free of charge upon request if information is incorrect due to our error. The *Daily* reserves the right not to print any classified ad.

341 - APTS., ROOMS, HOUSING

Renovated 4 1/2 - 1 minute from campus, new hardwood floors; huge closed bedrooms \$560. All utilities included. Suit two students. 481-8870 for details.

Corner of St. Urbain + St. Joseph, spacey 7/12 (unheated). Renovated, very clean + quiet. Minutes downtown. A must see. Nov. 1, 600\$. Call 276-3658 after 5 pm.

Apartment to sublet IMMEDIATELY! 2 1/2, clean, balcony, bright, carpeted, very close, heat & hot water included, laundry facilities, 3650 Mountain, \$485/month. Call 287-1049.

4 1/2 Apt. to share. Clean, bright, near campus, metro. Ideal for quiet student. Non smoking preferred. \$180/mo. Please phone Francisco morning or evening after 8, weekend. 288-3323.

Looking for a roommate. Nice apartment close to Place St. Henri metro station. \$250/mo. Call Sueli at 935-9198 or 521-2467 (1 to 6 pm).

343 MOVERS

3/4 ton Econoline - available for moving - Alex, 324-3794.

350 - JOBS

Bartenders - Get yourself a very lucrative part-time job. The Master School of Bartending offers training courses and placement service, 2021 Peel Street (Peel Metro). 849-2828. (Student Discounts).

352 - HELP WANTED

Public Opinion Polling - needed - Well spoken Bilingual people to conduct public opinion telephone surveys - No Selling! Saturday Thursday, afternoon + evening shifts. Location Old Montreal. \$6/hr. 842-9725.

Photographer needs attractive female models for nude figure studies. Call Ken after 7 p.m. on Tuesdays and Thursdays at 683-7881.

• LOST •
ONE BLACK JACKET AT
DETOUR ON THURS.
OCT. 27
PLEASE RETURN TO
MITU AT 398-6784/85

Attractive hourly rates.

354 - TYPING SERVICES

Success to all students. Theses, Term papers, Resumes, Translations, 19 years of experience, Rapid Service. 7 days a week. \$1.50 double spaced. IBM. On McGill campus, Peel St., CALL Paulette Vigneault 288-9638.

One-Day-Service. B Commerce background. Editing if required. Quality work. Excellent presentation. Improved grade guaranteed. Skilled with words. Electronic Memorywriter. Academic papers, C.V's These. 340-9470.

RESULT RESUMES: 17 year proven job-finder. Quality IBM processing-print, in depth consulting, free sample. Also student paper orientating: Tutoring, editing, consulting, typing. 488-5694.

Word Processing and Translation Services. Repeat letters, CVs, theses, term papers, etc. (\$1.50 d.s.). Business hours. For evenings/weekends by appointment. Milton/University. Mrs. C. Frenette, (844-9817).

Typing services - Term papers, theses, resumes, fast and efficient, 7 days a week, French and English. \$1.50/double spaced. Next to McGill. Call Roxanne. 288-0016 or 765-9804.

Word processing of handwritten term papers, resumes, etc., Transcription of cassettes, Fax. N.D.G. TYPING 482-1512.

Bilingual professional services. Resumes, cover letters, translation, editing, typing (theses). Typing courses. Reasonable rates. (342-8197).

Word Processing by B.Sc. Prompt

Professional Service. All Documents. Consulting, translation, tape transcription. Specialists in medical/scientific text. Also do desktop presentations with laser printer. On-Campus pick-up and delivery. 487-5174.

356 SERVICES OFFERED

EXPERT ESSAY HELP. TUTORING, RESEARCH, EDITING BY ACCREDITED STUDENT TEACHER. \$4/PAGE. 281-7985

A. Shedov Horticulture - for your complete garden winterizing 324-3794/389-7270.

Willing females and males needed for student haircuts. Supervised by professionals. Tuesdays 6 p.m. for cuts \$10, 5 p.m. for technical work. \$12 tints only, \$18 perms + highlights. Estetica 2175 Crescent. For appointments 849-9231.

361 ARTICLES FOR SALE

White Goose Down Coats - men, women - reg. \$295 only \$149 many styles many colors (including black). Parkas, 3/4, 7/8, full - EXXA downtown, 550 President Kennedy.

Hate Snow? Fly vancouver cheap! Leaving Montreal Dec. 23rd - Back Jan. 3rd. Excellent deal, call now 284-6403 late 'till 1:30 a.m. okay and mornings.

370 LOST AND FOUND

FOUND! On Monday Oct. 17 in Leacock Bldg in Room 219 a Textbook. Please contact 7222.

FOUND! Sharp calculator. Burnside basement, on Oct. 13. For return call 285-1812.

Found! Sunglasses on Redpath Crescent. Call 744-3201.

Whoever picked up a black leather blazer at Gert's on Saturday, please return it - it was hard telling my roommate I lost her jacket! Phone 279-2488.

Found Watch GERTS, 21/10. Contact 285-1115.

Help! I lost my wallet, have important papers in there on Monday 24, Union building Cafeteria. I'm from Mexico call me Jose Hernandez 488-4531.

I found a very nice black leather hat in the Alley last Wednesday. If it's yours (I've seen your signs & tried calling no avail) Call me Radio 398-6787, McGill Misha.

Lost: Oct. 17, possibly in 132 Leacock, Blue Binder containing notes from the following: Poli. Sci. 356-A; Philosophy 324-A; English 279-A. No questions asked. REWARD! 334-7670.

\$100 CASH for return of leather Schoolbag lost at Union Hall Thursday Night. Bruce, 345-1164.

374 - PERSONAL

Need Information? Feeling lonely? Just want to chat? Then call McGill Nightline! We are students talking to students. 398-6246, 7 days a week, 6 p.m. to 3 a.m. Anonymous and confidential.

Gays and Lesbians of McGill offer a peer counselling service, Monday through Wednesday, from 7:00 pm to 10:00 pm. 398-6822. It's a chance to talk.

Frosty says...

"Don't be a social outcast, brush your teeth daily."



NDG-Rhino Kick-Off party and pamphlet launch. Thursday November 3, 8 p.m. MA2 (Ma Hellers) 5617 Sherbrooke West (Vendome Metro; 105 Rhino bus). \$5.00 CHEAP!

IS M FOR MYSTERIOUS? - DIRTY BLOND.

383 LESSONS OFFERED

LSAT & GMAT preparation courses. Our courses which include live instruction and voluminous homework materials have been offered since 1979 - For more information 1-800-387-1262.

385 - NOTICES

ANIMAL RIGHTS! A new group called META - McGill for the Ethical Treatment of Animals is looking for members. Call Steve at 272-5064.

St. Martha's In-The-Basement. Informal, ecumenical worship every Sunday 10:30 a.m. in the basement of 3521 University. Info. Roberta Clare, Presbyterian-United Chaplaincy, 398-4104.

Native Canadian Students (and others): Concerned about native issues? We are! Call Paula 939-5813 or come to U-B10 at 4:30 on Wednesdays.

**Direct funding means continued
& improved Legal Aid Services at McGill!**

VOTE YES on November 9, 10 & 11
In the MCGILL LEGAL AID REFERENDUM!
Don't let apathy impair such a vital service!

CHOOSE ANY OF OUR

SUPER SPECIALS AT

RAOUF HAKIM

FREE CONTACT LENSES
(Soft Daily)
With the purchase of a frame and prescription glasses at regular price.

SOFT CONTACT LENSES
Daily Wear - \$99
Extended Wear - \$139
Tinted Lenses - (Choice of 5 Colors) - \$169

FRAME FREE
2 for 1
Buy a frame with prescription glasses and with the purchase of the second pair of glasses get the second frame free.

RAOUF HAKIM, O.O.D.

3550 COTE DES NEIGES, TEL. 932-2433 Eye examination available by optometrist

MEN
Cut, blow-dry, & shampoo
\$10.00

SALON DE COIFFURE JOVEN
Elle et Lui
SUPER SPECIAL ON PERMS

Including shampoo, cut, styling, rinse, mousse, streaks:
\$30.00

WOMEN
Cut, blow-dry, & shampoo
\$14.00

425 deMaisonneuve West • 844-7748
Welcome students, professors & personnel

Boutique

Jolique II

LEVI'S

Red Tab "531"
Black • Stone Washed • Bleached
\$36.99
Reg. 51.99

LEVI'S

Red Tab "501"
Button Fly! Black • Stone Washed
\$40.99
Reg. 59.99

LEVI'S

Jean Jackets
Black • Stone Washed
\$46.99
Reg. 65.99

LEVI'S

Jean Shirts
Black • Stone Washed
\$34.99
Reg. 46.99

Selected Men's and Women's Sweaters
19.99
Lots of New styles and colors to choose from!

Student's ONLY
1/3 off
on All our merchandise (except Levi's)

Men's and Women's assorted "Tops"
12.99
2 / \$20.00
Including: Sweatshirts • Turtlenecks • Shirts

Bring Student I.D. or copy of ad.

Jolique II

Peel Metro (Entrance Stanley) 845-8531 Offer expires Nov. 5, '88

Aerosols: heating the earth

by Lorraine Brown

Industrial chemicals called chlorofluorocarbons (CFC's) are making an increasingly significant contribution to the 'greenhouse effect', according to Dr. Wayne Evans, a scientist at Environment Canada's Atmospheric Environment Service in Downsview, Ontario.

His studies have provided solid evidence that CFC's are increasingly contributing to the heating of the earth—their effect has doubled since 1975. If they keep increasing in the atmosphere at the present rate, they could have as large a greenhouse effect as carbon dioxide in 10 years.

Naturally occurring atmospheric gases such as water vapour and carbon dioxide store heat radiation from the sun and re-emit it back toward the earth—the greenhouse effect. CFC's, which are widely used in aerosol sprays, plastic hamburger cartons and refrigeration units, have escaped into the atmosphere and are also emitting heat radiation back to the earth.

Evans has been measuring the increase in radiation from CFC's, using instruments carried into the upper atmosphere on balloons.

These measurements showed that the increase in radiation from CFC's has more than doubled since 1975, with the result that the earth is retaining 0.1 percent more heat than it did when he began his work in 1972. This work provides the first solid evidence of the growing effect of CFC's on the earth's radiation budget.

The greenhouse effect, however, is not all that bad. If it weren't for water vapour and carbon dioxide re-mitting their stored heat in our direction, the earth would be, on average, 15 degrees Celsius colder. The greenhouse effect has been keeping the earth warm for millions of years.

As the concentration of atmospheric gases has increased, due to human activity, the amount of heat emitted back to the earth has been increasing, and the earth has been gradually getting warmer.

CFC's are newcomers in the atmosphere, having been developed by chemists in the 1950's. According to Evans, they are "very strong greenhouse gases," with enormous capacity to absorb heat radiation. "If we had dreamt up a compound to deliberately induce the greenhouse effect we couldn't have come up with anything better than CFC's."

The amount of CFC's in the atmosphere is increasing about six to seven percent a year. At present Evans estimates that the increased heat reaching the earth is about 60 percent due to carbon dioxide and 30 percent due to CFC's.

Further up in the atmosphere CFC's also contribute to the breakdown of the ozone layer that shields the earth from the sun's ultraviolet radiation. On September 1987 in Montreal, 30 nations, including Canada, signed a United Nations Environment Program (UNEP) agreement to halve the consumption of CFC's by the year 2000. Each signatory must now ratify the agreement by passing

appropriate legislation, then present the documents to the U.N.

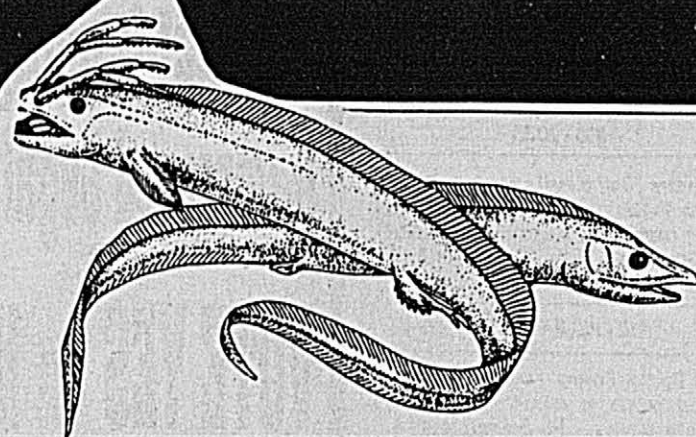
However, at even half the consumption rate, CFC's will still be increasing in the atmosphere by about three percent a year. Despite the fact that we now have measurements proving that the earth's atmosphere is getting warmer, we probably won't feel the effects for several years. According to Evans, radiation changes precede temperature changes by about 50 years. This delay is due to the thermal inertia of the oceans.

Evans believes that we now know for certain that temperature changes will occur; the question is how big they will be.



YO SPECIAL FEDERAL ELECTION ISSUE MEETING

TODAY
Union B-03
16h30



EVENTS

McGill Student Pugwash: Important meeting at 19h00 in Burnside 305.

Hillel-I.A.P.C.: Showing of three hour Nightline Video. Israeli-Palestinian debate.

Hillel: Professor Howard Roiter will be speaking informally about the "Outremont affair: 'The future of Jews in Québec'". Everybody welcome for this lunch discussion. (Restaurant on premises), 12h00 at 3460 Stanley. Call Joy at 845-9171 for more info.

GOOD YEAR



* Must have a Student I.D.

Goodyear Canada Inc.
Goodyear Service Automobile Garanti

10% OFF

Parts and Labour
(except specials)

Only valid at this address.

11 Maisonneuve
Montréal, P.Q. H2X 3N5
Telephone (514) 849-8031

copies
mcgill

PHOTOCOPIES
AS LOW AS

• Reduced Rates for large quantities
(with student I.D.)

OPEN MON - FRI 8:30 am - 7:00 pm
908 Sherbrooke St. West (facing McGill University)

5¢
8 1/2 X 11 or
8 1/2 X 14

844-5910